



Great Brighams Mead, Reading RG1

ENERGY & SUSTAINABILITY STATEMENT

Two-storey rooftop extension

May 2023

Document Issue Register

1.0 Planning Issue

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1 Introduction

- 1.1 This report details an Energy & Sustainability Statement for the proposed development at Great Brighams Mead, Reading RG1.
- 1.2 The existing property comprises a 3-storey office building with proposed conversion to planning use class C1. The proposal entails the construction of a two-storey rooftop extension, also comprising planning use class C1 units.
- 1.3 The proposed rooftop extension will feature insulation standards which improve upon the building regulations minimum standards, thereby achieving a ‘fabric-first’ approach. Furthermore, air-source heat pumps will provide efficient heating and hot water.
- 1.4 The purpose of this report is to review the sustainability requirements at local and national level, and to discuss how these requirements have been met, including the Reading Borough Local Plan (Adopted November 2019), the Reading Borough Sustainable Design and Construction Supplementary Planning Document (Adopted December 2019), the National Planning Policy Framework (NPPF) and the Building Regulations: Part L.



Figure 1: Site (yellow), aerial view (source: Google Earth)

2 Executive Summary

- 2.1 The development has been shown to meet the national & local sustainability requirements. These include the Reading Borough Local Plan (Adopted November 2019), the Reading Borough Sustainable Design and Construction Supplementary Planning Document (Adopted December 2019); along with the Building Regulations Part L requirements.
- 2.2 A 40% CO₂ reduction has been achieved, due to the 'fabric-first' approach and air-source heat pumps providing domestic hot water, whilst a separate VRF air-source heat pump would provide space heating and cooling. The development avoids natural gas heating, aligning with the national requirement to eliminate gas boilers by 2025.

Policy	Requirements	Achieved?
Reading Validation Requirements	incorporate measures to adapt to climate change in accordance with policies CC2, CC3, CC4, CC5, EN18 and H5	✓
Reading Borough Local Plan	use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change	✓
Building Regulations Part L	demonstrate compliance with Part L of the Building Regulations	✓
BRE Water Efficiency Tool	target internal water use of 110 L/person/day	✓
BREEAM Pre-Assessment	BREEAM 'Excellent' Rating Achieved (score 76.69%)	✓

3 Local Requirements and Guidance

3.1 Reading Validation Checklist

3.2 According to the Reading Validation Checklist (full applications for planning permission), an Energy Efficiency Statement is required:

3.3 *“Major planning applications are required to provide a statement. For Minor applications energy efficiency details can be included in a Sustainability Statement (see item 20).”*

3.4 According to the Reading Validation Checklist (full applications for planning permission), a Sustainability Assessment should address the following:

3.5 *“All development will need to demonstrate how it has been designed to incorporate measures to adapt to climate change in accordance with policies CC2, CC3, CC4, CC5, EN18 and H5 of the Reading Borough Local Plan (2019) and a more formal Energy Statement is required for all major development (see item 7 above).”*

3.6 Reading Borough Local Plan Policy CC2 (Sustainable Design & Construction)

3.7 *Proposals for new development, including the construction of new buildings and the redevelopment and refurbishment of existing building stock, will be acceptable where the design of buildings and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.*

To meet these requirements:

- *All major non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM ‘Excellent’ standards, where possible;*

- *All minor non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM 'Very Good' standard as a minimum;*
- *All non-residential development or conversions to residential should incorporate water conservation measures so that predicted per capita consumption does not exceed the appropriate levels set out in the applicable BREEAM standard. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy and cost effective.*

3.8 Reading Borough Local Plan Policy CC3 (Adaptation to Climate Change)

3.9 *All developments will demonstrate how they have been designed to incorporate measures to adapt to climate change. The following measures shall be incorporated into development:*

- *Wherever possible, new buildings shall be orientated to maximise the opportunities for both natural heating and ventilation and reducing exposure to wind and other elements;*
- *Proposals involving both new and existing buildings shall demonstrate how they have been designed to maximise resistance and resilience to climate change for example by including measures such as solar shading, thermal mass, heating and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, green walls, etc;*
- *Use of trees and other planting, where appropriate as part of a landscape scheme, to provide shading of amenity areas, buildings and streets and to help to connect habitat, designed with native plants that are carefully selected, managed and adaptable to meet the predicted changed climatic conditions; and*
- *All development shall minimise the impact of surface water runoff from the development in the design of the drainage system, and where possible*

incorporate mitigation and resilience measures for any increases in river flooding levels as a result of climate change.

3.10 Reading Borough Local Plan Policy CC4 (Decentralised Energy)

3.11 *In meeting the sustainability requirements of this plan, developments of the sizes set out below shall demonstrate how consideration has been given to securing energy for the development from a decentralised energy source.*

3.12 *Any development of more than 20 dwellings and/ or non-residential development of over 1,000 sq m shall consider the inclusion of decentralised energy provision, within the site, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision.*

3.13 *Where there is existing decentralised energy provision present within the vicinity of an application site, further developments of 10 dwellings or more or non-residential development of 1,000 sq m or more will be expected to link into the existing decentralised energy network or demonstrate why this is not feasible.*

3.14 Reading Borough Local Plan Policy CC5 (Waste Minimisation and Storage)

3.15 *Development should demonstrate measures to minimise the generation of waste in the construction, use and life of buildings and promote more sustainable approaches to waste management, including the reuse and recycling of construction waste and the promotion of layouts and designs that provide adequate, well-designed space to facilitate waste storage, reuse, recycling and composting.*

3.16 Other Local Plan Policies:

3.17 EN18 Flooding and Sustainable Drainage Systems; H5 Standards for New Housing

4 Energy

- 4.1 The development will meet the requirements of Building Regulations Approved Document L Conservation of Fuel And Power 'Volume 2: Buildings other than dwellings'.
- 4.2 This includes the Building Emissions Rate (BER) meeting the Target Emissions Rate (TER), and the Building Primary Energy Rate (BPER) meeting the Target Primary Energy Rate (TPER).
- 4.3 The three steps of the Energy Hierarchy will be followed in order to achieve this: "Be Lean; Be Clean; Be Green".

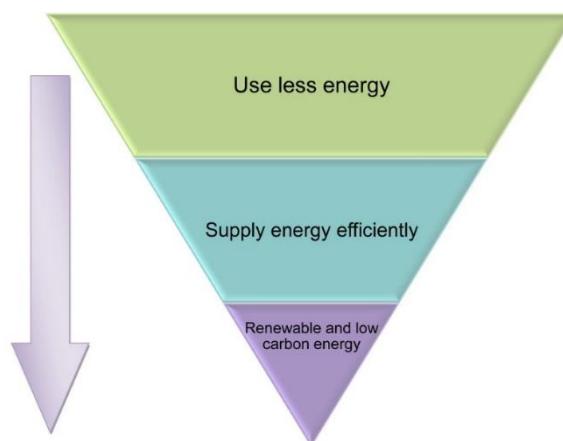


Figure 2: Energy Hierarchy

4.4 Be Lean

- 4.5 Improved passive energy performance ('Be Lean') will be achieved through the specification of high-performing building fabric (U-values which improve upon the Part L requirements).

4.6 Efficient heating systems will be installed (highly efficient electric air-source heat pumps) with controls which meet the Building Services Compliance Guide requirements, and LED Lighting will be implemented throughout.

4.7 The proposed U-values for the development are demonstrated below:

Envelope Element	Part L U-Value Limit (W/m ² K)	Proposed U-Values (W/m ² K)
External Wall	0.26	0.16
Floor	0.18	0.16
Roof	0.18	0.15
Windows	1.60	1.20
Rooflights	2.20	1.20
Air Permeability	8m ³ /(h.m ²) @ 50Pa	5m ³ /(h.m ²) @ 50Pa

4.8 Be Clean

4.9 It is not currently feasible to connect to a District Heat Network (DHN), however consideration has been given to efficient distribution of energy on site.

4.10 Be Green

4.11 Air-source heat pumps (ASHP) have been proposed to provide domestic hot water, whilst a separate VRF air-source heat pump would provide space heating and cooling, which will contribute a significant proportion of the site energy demand.

4.12 The air-source heat pumps are considered to be a renewable energy technology, as approximately 4 times the electrical energy input is extracted from the external environment and delivered to the building.

- 4.13 A rooftop solar PV array has been proposed, with 150no. 300W panels mounted on south-facing A-frames, for a total installed capacity of 45kW.
- 4.14 The proposed Energy Strategy with renewable energy systems, results in a reduction in CO₂ emissions of 40% compared to the Part L baseline.
- 4.15 The regulated carbon emissions for the development have been determined based on modelled SBEM results for the proposed rooftop extension (class C1).
- 4.16 The GLA CO₂ tables have been provided in Appendix 2, whilst the As-designed SBEM reports have been provided in Appendix 3.
- 4.17 A summary of the development CO₂ performance is presented below:

Building Regulations Part L	CO ₂ emissions (tonnes CO ₂ /yr)	CO ₂ Savings (tonnes CO ₂ /yr)	Percentage Saving (%)
Part L 2021 Baseline	66.4		
BE LEAN: Reduce Demand	66.1	0.3	0%
BE CLEAN: Efficient Supply	66.1	0.0	0%
BE GREEN: Renewables	39.8	26.3	40%
Cumulative Savings	-	26.6	40%

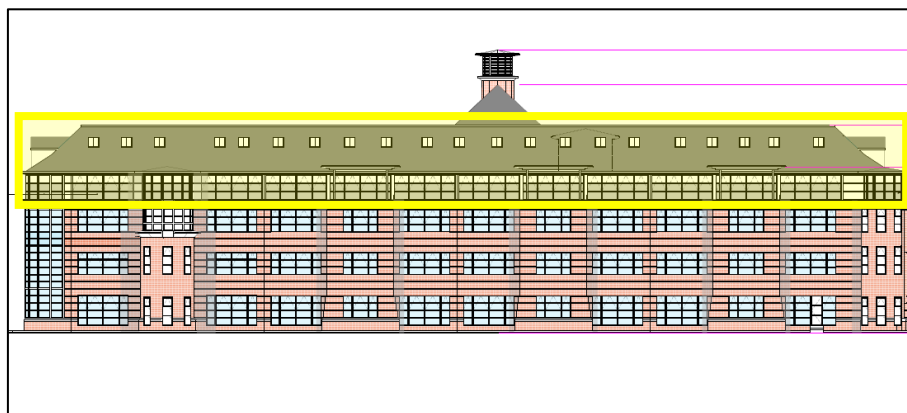


Figure 3: Proposed extension (yellow), west elevation

5 Sustainable Design

5.1 Water Use

5.2 Please see Appendix 1 – BRE Water Efficiency Calculator for further details relating to water consumption

5.3 The BRE Water Efficiency Calculator Tool has been used to predict water usage for the proposed dwellings.

5.4 A target of 110L/person/day has been proposed, which includes 5L/person/day for external water use. Whilst this target has not yet been adopted into local planning policy, the development will aim to meet this target (and will perform no worse than the Building Regulations requirement of 125L/person/day).

5.5 The consumption of water will be kept to a minimum within the proposed new dwellings through the implementation of water efficient fittings and appliances. These will include the following:

- Low-flow taps and showers
- Dual Flush WC's
- Low volume (to overflow) bathtub

5.6 Through the implementation of water efficient fittings and appliances, waste water will also be reduced within the proposed new dwellings.

5.7 Flood Risk

- 5.8 As shown in the Flood Risk Map below, the site of the proposed development lies in an area with high probability of flooding. (Flood Zone 3).
- 5.9 The development itself is a rooftop extension, and therefore will not be subject to a direct risk of flooding.
- 5.10 The proposed development will not increase the existing hardstanding on the site, and will therefore not result in increased discharge of rainwater to the existing drainage network.

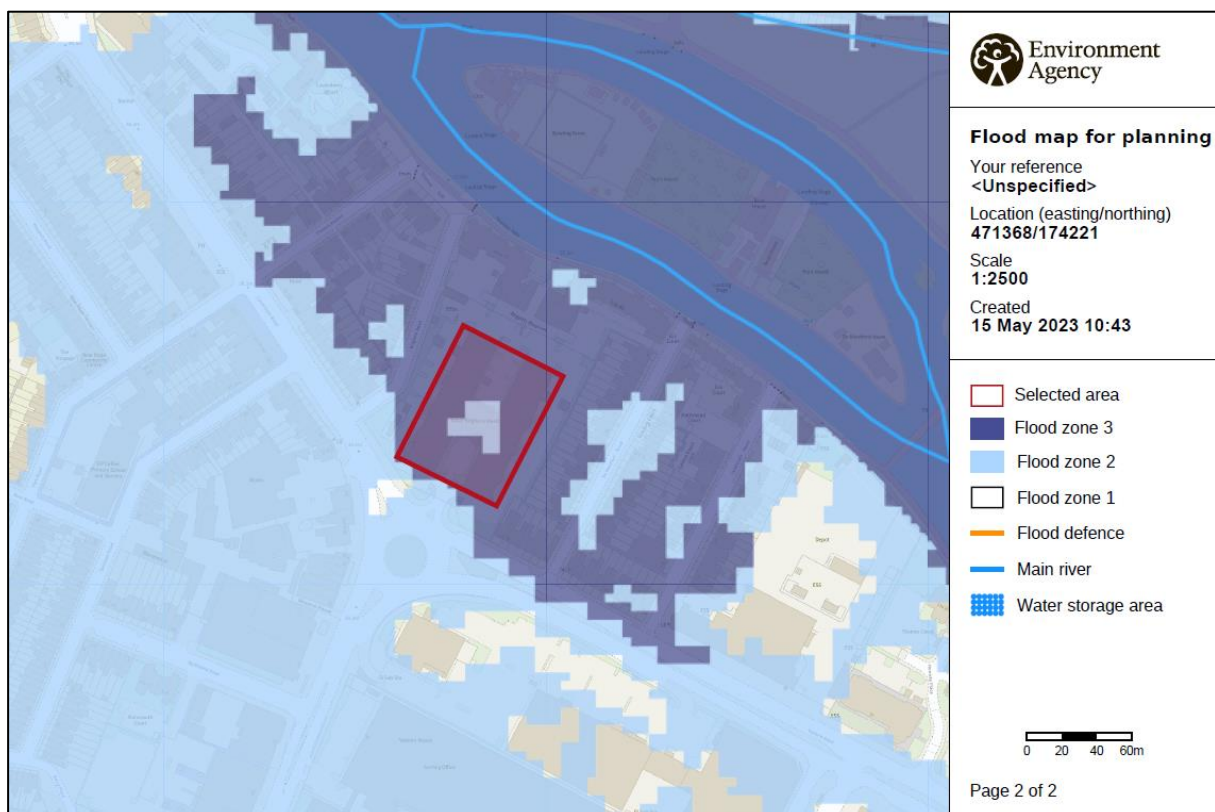


Figure 4: Reading Flood Zones (Source: Environment Agency)

5.11 Transport

5.12 The site of the proposed development is located 0.2 miles (5 minutes walking distance) from Reading Rail station, offering direct trains into London Paddington, (fast train 24 minutes), or London Waterloo calling at numerous economic centres en-route. Thus the site is suitably located for public transport.

5.13 Additionally, local buses operate in the area from the train station and Swansea Road near to the front of the development.

5.14 Vastern Road benefits from streetlighting and cycle/pedestrian sidewalks, and is therefore suitable for cycling and walking.

5.15 The scheme includes car charging points for electric vehicles.

5.16 Materials

5.17 Where possible, the development will make use of recycled building materials, such as responsibly sourced timber products. Any demolition waste will be salvaged and re-used as high grade aggregate elsewhere.

5.18 In addition to the structural materials, further sustainable materials will be included in the design of the building. These may include, for example:

- Mineral wool insulation – made from natural volcanic rock, recyclable
- Floor boards, structural roof timber – responsibly sourced timber products

5.19 The choice of insulation materials will consider not only thermal performance, but also the embodied carbon and other environmental performance indicators which will be obtained from the Environmental Product Declarations (EPDs).

6 Conclusion

- 6.1 The development has been shown to meet the national & local sustainability requirements. These include the Reading Borough Local Plan (Adopted November 2019), the Reading Borough Sustainable Design and Construction Supplementary Planning Document (Adopted December 2019); along with the Building Regulations Part L requirements.
- 6.2 A 40% CO₂ reduction has been achieved, due to the ‘fabric-first’ approach and air-source heat pumps providing heating and domestic hot water. The development avoids natural gas heating, aligning with the national requirement to eliminate gas boilers by 2025.
- 6.3 The BRE Water Efficiency Calculator Tool has been used to predict water usage for the proposed dwellings.
- 6.4 A target of 110L/person/day has been proposed, which includes 5L/person/day for external water use. Whilst this target has not yet been adopted into local planning policy, the development will aim to meet this target (and will perform no worse than the Building Regulations requirement of 125L/person/day).
- 6.5 A BREEAM rating of ‘Excellent’ has been demonstrated, in the attached BREEAM pre-assessment.

7 Appendix 1: BRE Water Efficiency Calculator Tool

Job no:
Date:
Assessor name:
Registration no:
Development name:

15/05/2023

Great Brighams Mead, Reading

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PRINTING: before printing please make sure that in "Page Setup" you have selected the page to be as "Landscape" and that the Scale has been set up to 70% (maximum)

WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALCULATOR)																					
House Type:		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10	
Description:		1-Bed C1 Unit		2-Bed C1 Unit																	
Installation Type	Unit of measure	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day
Is a dual or single flush WC specified?		Dual		Dual		Select option:		Select option:		Select option:		Select option:		Select option:		Click to Select		Click to Select		Click to Select	
	Full flush volume	4	5.84	4	5.84		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Part flush volume	2.6	7.70	2.6	7.70		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Taps (excluding kitchen and external taps)		6	11.06	6	11.06		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Flow rate (litres / minute)																				
	Are both a Bath & Shower Present?	Bath & Shower		Bath & Shower		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Bath	Capacity to overflow	150	16.50	150	16.50		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Shower	Flow rate (litres / minute)	9	39.33	9	39.33		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Kitchen sink taps	Flow rate (litres / minute)	6	13.00	6	13.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a washing machine been specified?		No		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Washing Machine	Litres / kg	7.2	17.16	7.2	17.16		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a dishwasher been specified?		No		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Dishwasher	Litres / place setting	1.22	4.50	1.22	4.50		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a waste disposal unit been specified?		No	0.00	No	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Water Softener	Litres / person / day		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Calculated Use		115.1		115.1			0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Normalisation factor		0.91		0.91			0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91
Code for Sustainable Homes	Total Consumption	104.7		104.7			0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
	Mandatory level	Level 3/4		Level 3/4			-		-		-		-		-		-		-		-
	External use	5.0		5.0			5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0
Building Regulations 17.K	Total Consumption	109.7		109.7			0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
	17.K Compliance?	Yes		Yes			-		-		-		-		-		-		-		-

8 Appendix 2: GLA CO2 Tables

Residential

Non-residential

Table 1: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential buildings

	Carbon Dioxide Emissions for residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	0.0	
After energy demand reduction (be lean)	0.0	
After heat network connection (be clean)	0.0	
After renewable energy (be green)	0.0	

Table 2: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for residential buildings

	Regulated residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.0	0%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	0.0	0%
Cumulative on site savings	0.0	0%
Annual savings from off-set payment	0.0	-
(Tonnes CO ₂)		
Cumulative savings for off-set payment	0	-
Cash in-lieu contribution (£)	0	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

Table 3: Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-residential buildings

	Carbon Dioxide Emissions for non-residential buildings (Tonnes CO ₂ per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	66.4	
After energy demand reduction (be lean)	66.1	
After heat network connection (be clean)	66.1	
After renewable energy (be green)	39.8	

Table 4: Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-residential buildings

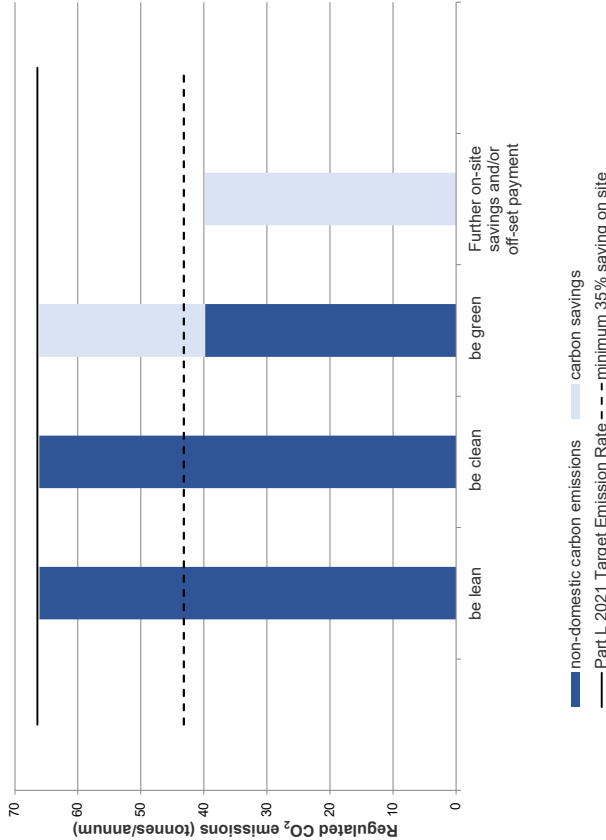
	Regulated non-residential carbon dioxide savings	
	(Tonnes CO ₂ per annum)	(%)
Be lean: savings from energy demand reduction	0.3	0%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	26.3	40%
Total Cumulative Savings	26.6	40%
Annual savings from off-set payment	39.8	-
(Tonnes CO ₂)		
Cumulative savings for off-set payment	1,195	-
Cash in-lieu contribution (£)	113,528	

*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development Information' tab

Domestic Part L 2021 Carbon Emissions



Non-domestic Part L 2021 Carbon Emissions



SITE-WIDE

	Total regulated emissions (Tonnes CO ₂ / year)	CO ₂ savings (Tonnes CO ₂ / year)	Percentage savings (%)
Part L 2021 baseline	66.4		
Be lean	66.1	0.3	0%
Be clean	66.1	0.0	0%
Be green	39.8	26.3	40%
Total Savings	-	26.6	40%
	-	CO ₂ savings off-set (Tonnes CO ₂)	-

	Target Fabric Energy Efficiency (kWh/m ²)	Dwelling Fabric Energy Efficiency (kWh/m ²)	Improvement (%)
Development total	0.00	0.00	

	Area weighted non-residential cooling demand (MJ/m ²)	Total non-residential cooling demand (MJ/year)
Actual		
Notional		

9 Appendix 3: As-Designed SBEM Reports

Project name

GREAT BRIGHAMS MEAD - BE LEAN

As designed

Date: Mon May 15 10:26:59 2023

Administrative information

Building Details

Address: READING, RG

Certifier details

Name: Chris Collier

Telephone number:

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.19

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 2523.84The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	13.46
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	13.4
Target primary energy rate (TPER), kWh _{PE} /m ² annum	145.85
Building primary energy rate (BPER), kWh _{PE} /m ² annum	145.28
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.16	0.2	RM000008_W4_A0
Floors	0.18	0.16	0.16	C1000000_F_A3
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.15	0.15	RM000000_C
Windows** and roof windows	1.6	1.2	1.2	RM000000_W-1_O0
Rooflights***	2.2	1.2	1.2	C1000000_C_O0
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check.

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	5

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- Be Lean

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.69	5.89	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- SYST0001-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	2.86	0.01
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		Zone	Standard
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value		95	80	0.3
C1 EN-SUITE		105	-	-
C1 EN-SUITE		105	-	-

[illegible]

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
MR	NO (-64%)	NO
OFFICE	N/A	N/A
RECEPTION	YES (+29%)	NO
STAFF	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	4936.1	4936.1
External area [m ²]	5400.4	5400.4
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	1758.49	1902.34
Average U-value [W/m ² K]	0.33	0.35
Alpha value* [%]	37.53	29.79

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area Building Type

Retail/Financial and Professional Services
 Restaurants and Cafes/Drinking Establishments/Takeaways
 Offices and Workshop Businesses
 General Industrial and Special Industrial Groups
 Storage or Distribution

100 Hotels

Residential Institutions: Hospitals and Care Homes
 Residential Institutions: Residential Schools
 Residential Institutions: Universities and Colleges
 Secure Residential Institutions
 Residential Spaces
 Non-residential Institutions: Community/Day Centre
 Non-residential Institutions: Libraries, Museums, and Galleries
 Non-residential Institutions: Education
 Non-residential Institutions: Primary Health Care Building
 Non-residential Institutions: Crown and County Courts
 General Assembly and Leisure, Night Clubs, and Theatres
 Others: Passenger Terminals
 Others: Emergency Services
 Others: Miscellaneous 24hr Activities
 Others: Car Parks 24 hrs
 Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	9.36	10.59
Cooling	3.74	3
Auxiliary	5.2	4.8
Lighting	4.3	4.54
Hot water	74.12	75.6
Equipment*	18.88	18.88
TOTAL **	96.72	98.53

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>0</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	168.02	167.97
Primary energy [kWh _{PE} /m ²]	145.28	145.85
Total emissions [kg/m ²]	13.4	13.46

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	90.1	60	9.5	3.8	5.3	2.64	4.4	2.69	5.89
	Notional	101.9	48.1	10.7	3	4.5	2.64	4.4	----	----
[ST] No Heating or Cooling										
	Actual	0	1553.1	0	0	0	0	0	0	0
	Notional	0	1553.3	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Project name

**GREAT BRIGHAMS MEAD - BE GREEN
45kW PV**

As designed

Date: Mon May 15 10:31:14 2023

Administrative information

Building Details

Address: READING, RG

Certifier details

Name: Chris Collier

Telephone number:

Address: , ,

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.19

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 2523.84The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	13.46
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	8.07
Target primary energy rate (TPER), kWh _{PE} /m ² annum	145.85
Building primary energy rate (BPER), kWh _{PE} /m ² annum	87.26
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.16	0.2	RM000008_W4_A0
Floors	0.18	0.16	0.16	C1000000_F_A3
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.15	0.15	RM000000_C
Windows** and roof windows	1.6	1.2	1.2	RM000000_W-1_O0
Rooflights***	2.2	1.2	1.2	C1000000_C_O0
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check.

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	5

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	0.9 to 0.95

1- Main system - air source heat pumps (VRF)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.5	6.5	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	4.5	0.01
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		Zone	Standard
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A
C1 EN-SUITE	-	-	-	-	0.8	-	-	-	-		0.85	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value		95	80	0.3
C1 EN-SUITE		105	-	-
C1 EN-SUITE		105	-	-

[illegible]

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
MR	NO (-64%)	NO
OFFICE	N/A	N/A
RECEPTION	YES (+29%)	NO
STAFF	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
STORE	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A
WC	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	4936.1	4936.1
External area [m ²]	5400.4	5400.4
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	5	3
Average conductance [W/K]	1758.49	1902.34
Average U-value [W/m ² K]	0.33	0.35
Alpha value* [%]	37.53	29.79

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area Building Type

Retail/Financial and Professional Services
 Restaurants and Cafes/Drinking Establishments/Takeaways
 Offices and Workshop Businesses
 General Industrial and Special Industrial Groups
 Storage or Distribution

100 Hotels

Residential Institutions: Hospitals and Care Homes
 Residential Institutions: Residential Schools
 Residential Institutions: Universities and Colleges
 Secure Residential Institutions
 Residential Spaces
 Non-residential Institutions: Community/Day Centre
 Non-residential Institutions: Libraries, Museums, and Galleries
 Non-residential Institutions: Education
 Non-residential Institutions: Primary Health Care Building
 Non-residential Institutions: Crown and County Courts
 General Assembly and Leisure, Night Clubs, and Theatres
 Others: Passenger Terminals
 Others: Emergency Services
 Others: Miscellaneous 24hr Activities
 Others: Car Parks 24 hrs
 Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	5.6	10.59
Cooling	3.39	3
Auxiliary	5.2	4.8
Lighting	4.3	4.54
Hot water	47.11	75.6
Equipment*	18.88	18.88
TOTAL **	65.59	98.53

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	7.53	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>7.53</i>	<i>0</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	168.02	167.97
Primary energy [kWh _{PE} /m ²]	87.26	145.85
Total emissions [kg/m ²]	8.07	13.46

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	90.1	60	5.7	3.4	5.3	4.41	4.86	4.5	6.5
	Notional	101.9	48.1	10.7	3	4.5	2.64	4.4	----	----
[ST] No Heating or Cooling										
	Actual	0	1553.1	0	0	0	0	0	0	0
	Notional	0	1553.3	0	0	0	0	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

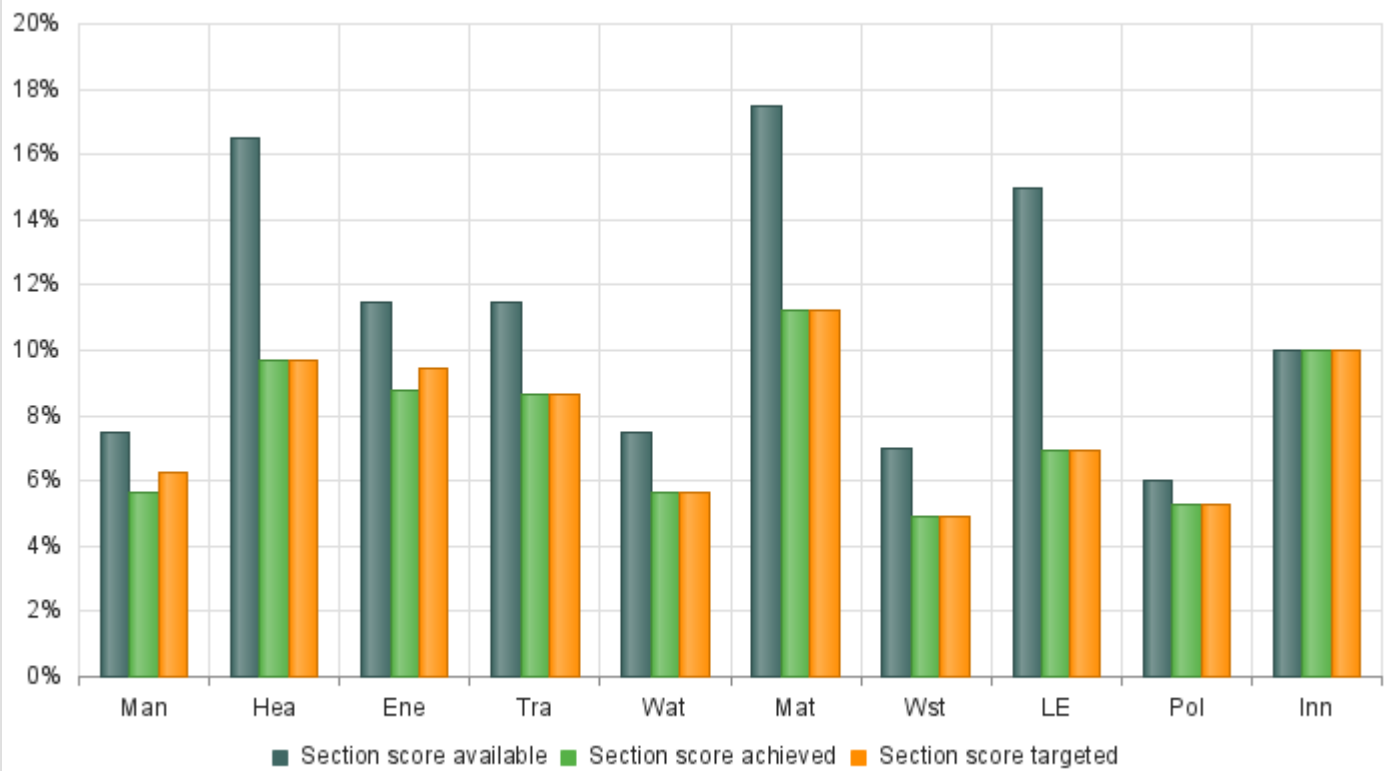
10 Appendix 4: BREEAM Pre-Assessment

Pre-assessment : Design (Interim) : GREAT BRIGHAMS MEAD PRE-ASSESSMENT (PRE-ASSESSMENT)

BREEAM Rating

	Credits available	Credits achieved	% Credits achieved	Weighting	Category score
Man	12.0	9.0	75.00%	7.50%	5.62%
Hea	17.0	10.0	58.82%	16.50%	9.70%
Ene	17.0	13.0	76.47%	11.50%	8.79%
Tra	12.0	9.0	75.00%	11.50%	8.62%
Wat	8.0	6.0	75.00%	7.50%	5.62%
Mat	14.0	9.0	64.29%	17.50%	11.25%
Wst	10.0	7.0	70.00%	7.00%	4.89%
LE	13.0	6.0	46.15%	15.00%	6.92%
Pol	8.0	7.0	87.50%	6.00%	5.25%
Inn	10.0	10.0	100.00%	10.00%	10.00%
Total	121.0	86.0	71.07%	-	76.69%
Rating	-	-	-	-	 Excellent

Performance by environmental category



BREEAM UK New Construction Version 6

GREAT BRIGHAMS MEAD PRE-ASSESSMENT

Pre-assessment

15 May 2023

Assessment Report



Marks & Spencer's BREEAM Excellent Cheshire Oaks store (Image: Marks & Spencer)

Assessment references

Registration number:	PRE-ASSESSMENT	Date created:	12/5/2023
Created by:	Christopher Collier		

Site details

Site name:

Address:

Town:

County:

Post code:

Country:

Certificate details

The certificate will have the name of the architect (if entered above) and the name of the developer (from above).

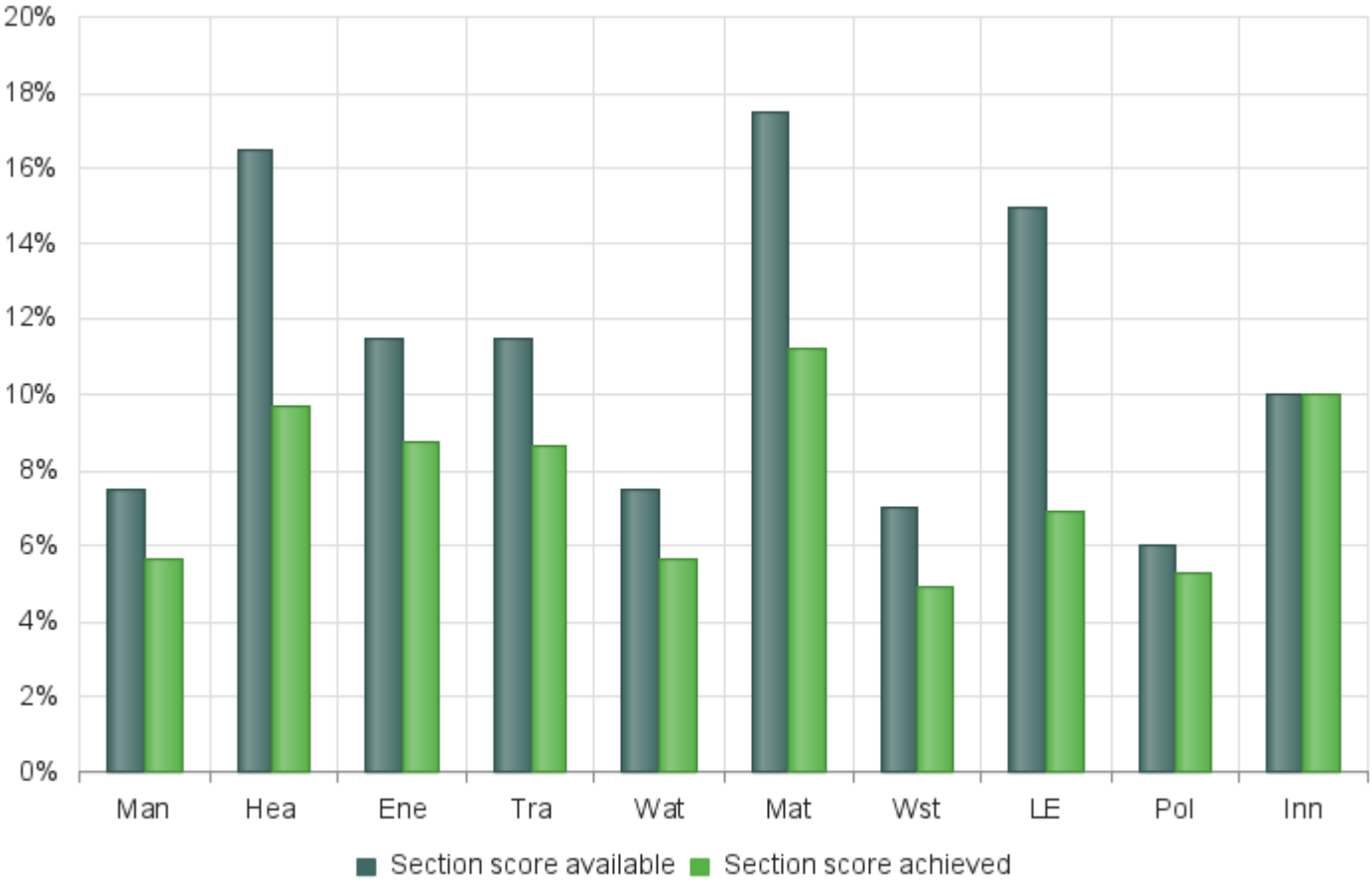
Any other names to appear on the certificate are listed below:

Name	Label
------	-------

BREEAM Rating

	Credits available	Credits achieved	Credits targeted	% Credits achieved	Weighting	Category score	Target score
Man	12.0	9.0	10.0	75.00%	7.50%	5.62%	6.25%
Hea	17.0	10.0	10.0	58.82%	16.50%	9.70%	9.70%
Ene	17.0	13.0	14.0	76.47%	11.50%	8.79%	9.47%
Tra	12.0	9.0	9.0	75.00%	11.50%	8.62%	8.62%
Wat	8.0	6.0	6.0	75.00%	7.50%	5.62%	5.62%
Mat	14.0	9.0	9.0	64.29%	17.50%	11.25%	11.25%
Wst	10.0	7.0	7.0	70.00%	7.00%	4.89%	4.89%
LE	13.0	6.0	6.0	46.15%	15.00%	6.92%	6.92%
Pol	8.0	7.0	7.0	87.50%	6.00%	5.25%	5.25%
Inn	10.0	10.0	10.0	100.00%	10.00%	10.00%	10.00%
Total	121.0	86.0	88.0	71.07%	-	76.69%	77.99%
Rating	-	-	-	-	-	★★★★☆ Excellent	Excellent

Performance by environmental category



Issue scores

Please Note: X means the exemplary credit for the relevant issue

Management

Man 01 Project Brief and design

2 / 2 X: 2 / 2

Man 02 Life cycle cost and service life planning

1 / 1

Man 03 Responsible construction practices

2 / 4 X: 0 / 2

Man 04 Commissioning and handover

2 / 2

Man 05 Aftercare

2 / 3

Health and Wellbeing

Hea 01 Visual comfort

2 / 4 X: 1 / 2

Hea 02 Indoor air quality

1 / 3 X: 0 / 1

Hea 04 Thermal comfort

3 / 3

Hea 05 Acoustic performance

2 / 4

Hea 06 Security

1 / 1 X: 1 / 1

Hea 07 Safe and Healthy Surroundings

1 / 2

Energy

Ene 01 Reduction of energy use and carbon emissions

8 / 9 X: 4 / 7

Ene 02 Energy monitoring

2 / 2

Ene 03 External lighting

1 / 1

Ene 05 Energy efficient cold storage

N/A

Ene 07 Energy efficient laboratory systems

N/A

Ene 04 Low carbon design

2 / 3

Ene 06 Energy efficient transportation systems

0 / 2

Ene 08 Energy efficient equipment

N/A

Transport

Tra 01 Transport assessment and travel plan

2 / 2

Tra 02 Sustainable transport measures

7 / 10

Water

Wat 01 Water consumption

3 / 5 X: 0 / 1

Wat 03 Water leak detection

2 / 2

Wat 02 Water monitoring

1 / 1

Wat 04 Water efficient equipment

N/A

Materials

Mat 01 Life cycle impacts

4 / 7 X: 0 / 2

Mat 02 Environmental impacts from construction products

1 / 1

Mat 03 Responsible sourcing

2 / 4 X: 0 / 1

Mat 05 Designing for durability and resilience

1 / 1

Mat 06 Material efficiency

1 / 1

Waste

Wst 01 Construction waste management

4 / 5 X: 0 / 1

Wst 02 Use of recycled and sustainably sourced aggregates

0 / 1 X: 0 / 1

Wst 03 Operational waste

1 / 1

Wst 04 Speculative finishes (Offices only)

N/A

Wst 05 Adaptation to climate change

1 / 1 X: 1 / 1

Wst 06 Design for disassembly and adaptability

1 / 2

Land use and ecology

LE 01 Site selection

1 / 2

LE 02 Ecological risks and opportunities

1 / 2 X: 1 / 1

LE 03 Managing impacts on ecology

2 / 3

LE 04 Ecological change and enhancement

1 / 4 X: 0 / 1

LE 05 Long term ecology
management and
maintenance

1 / 2

Pollution

Pol 01 Impact of refrigerants

N/A

Pol 02 Local air quality

2 / 2

Pol 03 Flood and surface
water management

4 / 5 X: 1 / 1

Pol 04 Reduction of Night
Time Light Pollution

1 / 1

Pol 05 Noise attenuation

N/A

Innovation

Inn 01 Innovation

0 / 0 X: 0 / 10

Initial details

Technical manual issue number : Issue 0.0

Project scope : Fully fitted - simple building

Building type (main description) : Residential institution (short term stay)

Sub-group : Hotel, hostel, boarding and guest house

Assessment stage : Design (interim)

Building floor area (GIA) : 4860 m²

Building floor area (NIFA) : 4400 m²

Is the building designed to be untreated? : No

Building services - heating system type : Other type of heating system

Building services - cooling system type : Comfort cooling

Does the building have external areas within the boundary of the assessed development? : No

Are commercial or industrial-sized refrigeration and storage systems specified? : No

Are building user lifts present? : Yes

Are building user escalators or moving walks present? : No

Are there any water demands present other than those assessed in Wat 01? : No

Are there statutory requirements, or other issues outside of the control of the project, that impact the ability to provide outdoor space : No

Are there any systems specified that contribute to the unregulated energy load? : No

Are the Post-occupancy evaluation credits targeted in Ene 01 issue? : No

Are laboratories present? : No

Are there fume cupboard(s) and/or other containment devices present? : No

Category assessment

Management (Man)

Man 01 Project Brief and design

To optimise final building design through recognising and encouraging an integrated design process and robust stakeholder engagement.

Assessment criteria

Stakeholder consultation (interested parties) :	Yes
Project delivery planning :	Yes
Prerequisite: Have the client and the contractor formally agreed performance targets? :	Yes
BREEAM Advisory Professional (Concept Design) :	Yes
BREEAM Advisory Professional (Developed Design) :	Yes

Credits awarded : 2

Exemplary credits awarded : 2

Man 02 Life cycle cost and service life planning

To promote the business case for sustainable buildings and to deliver whole life value by encouraging the use of life cycle costing to improve design, specification, through-life maintenance and operation.

Assessment criteria

Capital cost reporting :	Yes
Capital cost of the project :	1.5 Â£k/m ²

Credits awarded : 1

Man 03 Responsible construction practices

To recognise and encourage construction sites which are managed in an environmentally and socially considerate, responsible and accountable manner.

Assessment criteria

Prerequisite: Are all timber and timber-based products used during the construction process of the project 'legally harvested and traded timber'? :	Yes
---	-----

Environmental management :	Yes
Responsible construction management :	1
Monitoring of construction site impacts :	No

Key Performance Indicators: Construction site energy use

Energy consumption (total) - site processes :

Energy consumption (intensity) - site processes :

Key Performance Indicators: Construction site greenhouse gas emissions

Process greenhouse gas emissions (total) - site processes :

Carbon dioxide emissions (intensity) - site processes :

Credits awarded : 2

Man 04 Commissioning and handover

To encourage a properly planned handover and commissioning process that reflects the needs of the building occupants.

Assessment criteria

Commissioning testing schedule and responsibilities : Yes

Handover - have a technical and a non-technical building user guide been developed prior to handover? : Yes

Handover - have a technical and a non-technical training schedule been prepared around handover? : Yes

Credits awarded : 2

Man 05 Aftercare

To ensure the building operates in accordance with the design intent and operational demands, through providing aftercare to the building owner and occupants during the first year of occupation.

Assessment criteria

Is this a speculative development? : No

Aftercare support : Yes

Commissioning - implementation : Yes

Post occupancy evaluation :	Yes
The client or building occupier commits funds to pay for the POE in advance. :	No

Credits awarded : 2

Health and Wellbeing (Hea)

Hea 01 Visual comfort

To encourage best practice in visual performance and comfort by ensuring daylighting, artificial lighting and occupant controls are considered.

Assessment criteria

Control of glare from sunlight :	No
Daylighting (building type dependent) :	1
View Out :	Yes
Internal and external lighting levels, zoning and controls :	No
Exemplary level criteria - Daylighting :	Yes
Exemplary level criteria- Internal and external lighting levels, zoning and control :	No

Credits awarded : 2

Exemplary credits awarded : 1

Hea 02 Indoor air quality

To encourage and support healthy internal environments with good indoor air quality.

Assessment criteria

Prerequisite: Indoor air quality (IAQ) plan :	Yes
Are you complying with the Ventilation criteria? :	Yes
Emissions from construction products :	0
Exemplary level criteria: Emissions from construction products :	No

Credits awarded : 1

Hea 04 Thermal comfort

To ensure the building is capable of providing an appropriate level of thermal comfort.

Assessment criteria

Thermal modelling :	Yes
Design for future thermal comfort :	Yes
Thermal zoning and controls :	Yes

Key Performance Indicators

PMV and PPD Indices :

Credits awarded : 3

Hea 05 Acoustic performance

To ensure the building is capable of providing an appropriate acoustic environment to provide comfort for building users.

Assessment criteria

Sound insulation :	1
Indoor ambient noise level :	Yes
Room acoustics :	No

Credits awarded : 2

Hea 06 Security

To encourage the planning and implementation of effective measures that provide an appropriate level of security to the building and site.

Assessment criteria

Security of site and building :	Yes
Exemplary level criteria :	Yes

Credits awarded : 1

Exemplary credits awarded : 1

Hea 07 Safe and Healthy Surroundings

To encourage the provision of safe access around the site and outdoor space that enhances the wellbeing of building users. .

Assessment criteria

Safe Access :	Yes
Outside Space :	No

Credits awarded : 1

Energy (Ene)

Ene 01 Reduction of energy use and carbon emissions

To minimise operational energy demand, primary energy consumption and CO₂ emissions.

Energy performance

Country :	England
Upload building '_brukl.inp' file :	GREAT-BRIGHAMS-
Is space heating provided by a district (network) heating? :	No

Towards carbon negative (exemplary credits)

Zero net CO ₂ -eq emissions :	No
--	----

Energy performance - Building score

Heating and cooling demand energy performance ratio (EPRdem) :	0.253
Primary consumption energy performance ratio (EPRpc) :	0.3
CO ₂ -eq energy performance ratio (EPRco2-eq) :	0.327
Overall building energy performance ratio (EPRnc) :	0.88
Total BREEAM credits achieved :	8.0

Prediction of operational energy consumption

Has a passive design analysis been carried out? :	Yes
Have you undertaken detailed energy modelling (including scenario analysis) to predict operational energy consumption? :	Yes
Have you reported predicted energy consumption targets? :	Yes
Have you demonstrated that scenario analysis has informed improvements to the design, operational, maintenance and handover strategies? :	Yes

Post-occupancy evaluation (exemplary credits)

Has the maximum credit score been achieved in Ene 02 Energy monitoring? :	Yes
Has the client or building occupier committed funds to pay for the post-occupancy evaluation? :	Yes
Has the energy model been submitted to BRE or retained by the building owner/named third party? :	Yes

Credits awarded : 8

Exemplary credits awarded : 4

Ene 02 Energy monitoring

To encourage the installation of energy sub-metering that facilitates the monitoring of operational energy consumption. To enable managers and consultants post-handover to compare actual performance with targets in order to inform ongoing management and help in reducing the performance gap.

Assessment criteria

Sub-metering of end use categories : Yes

Sub-metering of high energy load and tenancy areas : Yes

Credits awarded : 2

Ene 03 External lighting

To reduce energy consumption through the specification of energy efficient light fittings for external areas of the development.

Assessment criteria

External lighting has been designed out? : Yes

Credits awarded : 1

Ene 04 Low carbon design

To encourage the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimise reliance on active building services systems.

Assessment criteria

Has the first credit within Hea 04 been achieved? : Yes

Passive design analysis : Yes

Free cooling : No

Low and zero carbon technologies : Yes

KPI

Total on-site and/or near-site LZC energy generation :

Expected energy consumption and CO₂-eq emissions reduction resulting

from passive design measures :

Expected energy consumption and CO₂-eq emissions reduction resulting

from passive design measures as a percentage :

Expected reduction in CO₂-eq emissions resulting from the LZC

technologies :

Expected reduction in CO₂-eq emissions resulting from the LZC

technologies as a percentage :

Credits awarded

: 2

Ene 05 Energy efficient cold storage

To encourage the installation of energy efficient refrigeration systems, in order to reduce operational greenhouse gas emissions resulting from the system's energy use.

Assessment criteria - N/A

Ene 06 Energy efficient transportation systems

To encourage the specification of energy efficient transport systems within buildings.

Assessment criteria

Energy consumption : No

Energy efficient features - Lifts : No

Credits awarded : 0

Ene 07 Energy efficient laboratory systems

To encourage laboratory areas that are designed to minimise their operational energy consumption and associated CO₂ emission

Assessment criteria - N/A

Ene 08 Energy efficient equipment

To encourage installation of energy efficient equipment to ensure optimum performance and energy savings in operation

Assessment criteria - N/A

Transport (Tra)

Tra 01 Transport assessment and travel plan

To reward awareness of existing local transport and identify improvements to make it more sustainable.

Assessment criteria

Travel plan :	Yes
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Credits awarded : 2

Tra 02 Sustainable transport measures

To maximise the potential for local public, private and active transport through provision of sustainable transport measures appropriate to the site.

Assessment criteria

Prerequisite :	Yes
Location type (based on existing AI) :	25 ≤ AI < 40 (urban centres)
Number of points achieved overall :	5

Credits awarded : 7

Water (Wat)

Wat 01 Water consumption

To reduce the consumption of potable water for sanitary use in new buildings through the use of water efficient components and water recycling systems.

Assessment criteria

Please select the calculation procedure used :	Standard approach
Credits awarded :	3
Exemplary performance :	No

Key Performance Indicators

Standard approach data: :

Water Consumption from building micro-components :	75 L/person/day
Water demand met via greywater/rainwater sources :	0 L/person/day
Total net water consumption :	75 L/person/day
Improvement on baseline performance :	40 %
Key Performance Indicator - use of freshwater resource: :	
Total net Water Consumption :	
Default building occupancy :	

Credits awarded : 3

Wat 02 Water monitoring

To reduce the consumption of potable water in new buildings through the effective management and monitoring of water consumption.

Assessment criteria

Water meter on the mains water supply to each building :	Yes
Sub-metering/monitoring equipment on supply to plant/building areas :	Yes
Pulsed output or other open protocol communication output and BMS	Yes

connection :

Credits awarded : 1

Wat 03 Water leak detection

To reduce the consumption of potable water in new buildings through minimising wastage due to water leaks.

Assessment criteria

Leak detection system : Yes

Flow control devices : Yes

Credits awarded : 2

Wat 04 Water efficient equipment

To reduce water consumption for uses not assessed under Wat 01 by encouraging specification of water efficient equipment.

Assessment criteria - N/A

Materials (Mat)

Mat 01 Life cycle impacts

To reduce the burden on the environment from construction products by recognising and encouraging measures to optimise construction product consumption efficiency and the selection of products with a low environmental impact (including embodied carbon), over the life cycle of the building.

Assessment criteria

Total Mat 01 credits achieved - taken from the Mat 01/02 Results 4

Submission Tool :

Total Exemplary credits achieved - taken from the Mat 01/02 Results 0

Submission Tool :

Credits awarded : 4

Mat 02 Environmental impacts from construction products

To encourage availability of robust and comparable data on the impacts of construction products through the provision of EPD.

Assessment criteria

Mat 02 credit achieved - Taken from the Mat 01/02 Results Submission 1

Tool. :

Credits awarded : 1

Mat 03 Responsible sourcing

To facilitate the selection of products that involve lower levels of negative environmental, economic and social impact across their supply chain including extraction, processing and manufacture.

Assessment criteria

Prerequisite: All timber and timber based products are 'Legally harvested and traded timber' : Yes

Has the enabling sustainable procurement credit been achieved? : Yes

Mat 03 minimum scope level : Superstructure

Percentage of available for percentage of RSM points achieved : 10 %

Credits awarded : 2

Mat 05 Designing for durability and resilience

To reduce the need to repair and replace materials resulting from damage to exposed elements of the building and landscape.

Assessment criteria

Protecting vulnerable parts of the building from damage and exposed parts of the building from material degradation : Yes

Credits awarded : 1

Mat 06 Material efficiency

To avoid unnecessary materials use arising from over specification without compromising structural stability, durability or the service life of the building.

Assessment criteria

Material optimisation measures investigated and implemented at all relevant stages : Yes

Credits awarded : 1

Waste (Wst)

Wst 01 Construction waste management

To reduce construction waste by encouraging reuse, recovery and best practice waste management practices to minimise waste going to landfill.

Assessment criteria

Is demolition occurring under the developer's ownership for the purpose of enabling the assessed development? : Yes

Pre-demolition audit : Yes

Compliant Resource Management Plan : Yes

Diversion of resources from landfill : Yes

Exemplary level criteria - Simple buildings : Yes

KPI

Measure/units for the data being reported : tonnes

Non-hazardous construction waste (excluding demolition/excavation) - fill in to award 'Construction resource efficiency' credits :

Total non-hazardous construction waste generated :

Non-hazardous non-demolition construction waste diverted from landfill - fill in to award diversion from landfill credit :

Total non-hazardous non-demolition construction waste diverted from landfill :

Non-hazardous demolition waste diverted from landfill - fill in to award diversion from landfill credit :

Total non-hazardous demolition waste generated :

Total non-hazardous demolition waste to disposal :

Non-hazardous excavation waste diverted from landfill - fill in to award credit :

Material for reuse :

Material for recycling :

Material for energy recovery :

Hazardous waste to disposal :

Credits awarded : 4

Wst 02 Use of recycled and sustainably sourced aggregates

To encourage the use of more sustainably sourced aggregates, encourage reuse where appropriate and avoid waste and pollution arising from disposal of demolition and other forms of waste.

Assessment criteria

Is demolition occurring under the developer's ownership for the purpose of enabling the assessed development? : Yes

Pre-requisite: pre-demolition audit : Yes

Projects Sustainable Aggregate points : 0

KPI

Total quantity of aggregate : 0 tonnes

% of high - grade aggregate that is recycled/ secondary aggregate by application : 0 %

Credits awarded : 0

Wst 03 Operational waste

To encourage the recycling of operational waste through the provision of dedicated storage facilities and space.

Assessment criteria

Compliant recycling and non-recyclable waste storage allocated : Yes

Static waste compactor(s) or baler(s) : Yes

Vessel(s) for composting suitable organic waste and water outlet : Yes

Credits awarded : 1

Wst 04 Speculative finishes (Offices only)

To minimise the wastage associated with the installation of floor and ceiling finishes in lettable areas in speculative buildings where tenants have not been involved in their selection.

Assessment criteria - N/A

Wst 05 Adaptation to climate change

To minimise the future need of carrying out works to adapt the building to take account of more extreme weather changes resulting from climate change and changing weather patterns.

Assessment criteria

Resilience of structure, fabric, building services and renewables installation Yes

:

Exemplary level - responding to climate change : Yes

Credits awarded : 1

Exemplary credits awarded : 1

Wst 06 Design for disassembly and adaptability

To avoid unnecessary materials use, cost and disruption arising from the need for future adaptation works as a result of changing functional demands and to maximise the ability to reclaim and reuse materials at final demolition in line with the principles of a circular economy.

Assessment criteria

Design for disassembly and functional adaptability - recommendations : Yes

Disassembly and functional adaptability - implementation : No

Credits awarded : 1

Land use and ecology (LE)

LE 01 Site selection

To encourage the use of previously occupied or contaminated land and avoid land which has not been previously disturbed.

Assessment criteria

Percentage of proposed development's footprint on previously occupied land: :	100 %
Contaminated land :	No

Credits awarded : 1

LE 02 Ecological risks and opportunities

To determine the existing ecological value associated with the site and surrounding areas, and the risks and opportunities for ecological protection and enhancement.

Assessment criteria

Assessment route selection :	Foundation
Prerequisite - Statutory obligations :	Yes
Survey and Evaluation :	Yes
Determining ecological outcomes :	Yes
Exemplary level - Wider site sustainability :	Yes

Credits awarded : 1

Exemplary credits awarded : 1

LE 03 Managing impacts on ecology

To avoid, or limit as far as possible, negative ecological impacts associated with the site and surrounding areas resulting from the project.

Assessment criteria

Assessment route :	Foundation
Prerequisite - Ecological risks and opportunities :	Yes

Planning and measures on-site :	Yes
Managing negative impacts :	Yes

Credits awarded : 2

LE 04 Ecological change and enhancement

To enhance ecological value of the area associated with the site in support of local, regional and national priorities.

Assessment criteria

Assessment route :	Foundation
Prerequisite - Managing negative impacts on ecology :	Yes
Change and enhancement of ecology (Foundation route only) :	Yes

Credits awarded : 1

LE 05 Long term ecology management and maintenance

To secure ongoing monitoring, management and maintenance of the site and its habitats and ecological features, to ensure intended outcomes are realised for the long term.

Assessment criteria

Assessment route :	Foundation
At least one credit achieved in LE 04 :	Yes
Prerequisite - Statutory obligations, planning and site implementation :	Yes
Management and maintenance throughout the project :	Yes
Landscape and ecology management plan :	Yes

Credits awarded : 1

Pollution (Pol)

Pol 01 Impact of refrigerants

To reduce the level of greenhouse gas emissions arising from the leakage of refrigerants from building systems.

Assessment criteria - N/A

Pol 02 Local air quality

To contribute to a reduction in local air pollution through the use of low emission combustion appliances in the building.

Assessment criteria

Is the project required to connect to a District Heating system, and it supplies all heating and hot water demands to the building? :	No
How many credits have been achieved? :	2

Credits awarded : 2

Pol 03 Flood and surface water management

To avoid, reduce and delay the discharge of rainfall to public sewers and watercourses, thereby minimising the risk and impact of localised flooding on-site and off-site, watercourse pollution and other environmental damage.

Assessment criteria

Prerequisite: Has an appropriate consultant demonstrated and confirmed the development's compliance with all criteria? :	Yes
Has a site-specific flood risk assessment been conducted? :	Yes
Annual probability of flooding :	Low
Minimising watercourse pollution :	Yes
Number of credits achieved for Simple Building assessment :	1
Exemplary level compliant :	Yes

Credits awarded : 4

Exemplary credits awarded : 1

Pol 04 Reduction of Night Time Light Pollution

To ensure that external lighting is concentrated in the appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption and nuisance to neighbouring properties.

Assessment criteria

External lighting has been designed out? :

Yes

Credits awarded : 1

Pol 05 Noise attenuation

To reduce the likelihood of noise arising from fixed installations on the new development affecting nearby noise-sensitive buildings.

Assessment criteria - N/A

Innovation (Inn)

Inn 01 Innovation	
To support innovation within the construction industry through the recognition of sustainability related benefits which are not rewarded by standard BREEAM issues.	
Assessment criteria	
Number of 'approved' innovation credits achieved? :	0
Credits awarded : 0	